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Task 9

Report on the Outcomes for Eastern Washington COHE, Expansion Counties

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Introduction

The Eastern Washington Center of Occupational Health and Education (COHE) served a three-county area (Spokane, Grant and Stevens counties) during its initial phase of operations. COHE providers started seeing workers in the three-county area in July 2003. Starting in June 2005 the COHE began recruiting health care providers practicing within an expanded rural area of eastern Washington covering an additional 13 counties (Adams, Asotin, Chelan, Columbia, Douglas, Ferry, Garfield, Lincoln, Okanogan, Pend O'Reille, Walla Walla, Whitman, and Yakima). The University of Washington (UW) previously examined outcomes for injured workers treated within the original three-county area served by the Eastern Washington COHE (Task 4, Report on the Outcome Evaluation for the Eastern Washington COHE (3 Counties), 30 June 2006). This report provides new information regarding outcomes for injured workers treated within the 13-county expansion area (workers treated within the original 3-county target area are not included).

The current analysis examined four outcome measures, incidence of time loss, time loss days, time loss costs and medical costs, based upon Department of Labor and Industries (DLI) administrative data, and employed the same analytical approach used to conduct our recent analysis for the original COHEs' later cohorts (Tasks 4 and 5, November 3, 2008). This approach (1) compares changes over time in outcomes between the COHE group and the comparison group and then (2) analyzes the difference in the respective changes. This method, commonly known as a difference-in-difference analysis, has gained wide use as a method of conducting evaluation research when a randomized trial is not practical.

Our statistical analysis found only small differences in changes in outcomes between the COHE group and comparison group. Because of this it did not seem useful to present the estimates generated by the multivariate analysis. Instead we report descriptive information (unadjusted

means) for the outcome measures for the baseline and follow-up periods. We conducted further analyses to gain additional insight into the COHE's effect. These analyses examined: (1) the effect on time loss of provider adoption of occupational health best practices, and (2) changes in time loss among primary care providers for back and other sprain cases.

Methods

The construction of the database used for the analysis involved several steps. First, we defined the baseline period and follow-up period: (1) baseline period, July 1, 2004 through June 30, 2005; and (2) follow-up period, July 1, 2006 through June 30, 2007. Thus, we compared changes from the baseline year to year two of COHE operation in the expansion counties. Second, we constructed for the analysis two cohorts of cases representing injured workers treated by COHE providers and injured workers treated by non-COHE providers. All injured workers (1) who were treated by a COHE provider and (2) whose date of claim receipt fell within the baseline or follow-up period were eligible for inclusion in COHE cohort. The comparison group consisted of two groups of injured workers: (1) workers who were treated by a non-COHE provider in one of the 13 expansion counties, and (2) workers treated in three counties in Eastern Washington (Benton, Franklin and Kittitas counties) designated as "control" counties (no COHE providers practiced within these three counties). In these three counties, all injured workers filing a workers' compensation claim that was received and accepted within the designated baseline and follow-up periods were designated as control cases. We tracked the three time loss outcome measures for one year following claim receipt and cumulated time loss days and time loss payments within that period. Because of practical data limitations, we could not track medical costs in a similar fashion. Instead we tracked medical costs through the closure of the claim or up to the point when the data were extracted (October 2008) whichever came first. Since medical costs did not have a defined tracking period, comparing changes in these costs over time is not appropriate, though comparisons within the baseline and follow-up periods can be made.

The total numbers of cases selected for analysis are shown in Table 1. Of the 33,319 cases analyzed, the COHE cases accounted for 14,176 (42.5%), and the comparison-group cases accounted for 19,143 (57.5%). Although not shown in Table 1, the COHE cases represent 263

COHE health care providers; the comparison-group cases represent 1,090 non-COHE providers. The distribution of claims by county is shown in Table 2. Yakima County accounted for 33.9% of all cases, followed by Benton County (17.8%) and Chelan County (16.5%). The counties classified as “other counties” shown in Table 2 accounted for approximately 4% of the total cases.

Results

Descriptive information (age, gender, injury type, provider type) for the study population is shown in Table 3. The average age of the COHE injured workers was 37; 70.5% of the COHE injured workers were male. Back sprain accounted for approximately 11.5% to 13.0% of the cases, carpal tunnel 1.3% to 0.9%, fractures 4.6% to 3.5%, and other sprains 18.8% to 24.1%. A greater proportion of injured workers in the COHE group than in the comparison group was treated by primary care health care providers (45.7% versus 33.3%), occupational medicine providers (9.2% versus 0.4%), or advanced registered nurse practitioners (ARNPs, 9.4% versus 2.9%). A somewhat greater proportion of injured workers in the comparison group was treated in emergency rooms (15.1% versus 10.5%). Provider billing numbers are not always unique to individual providers; hospital emergency department providers are allowed to bill under a single provider number. Thus, some “high volume providers” may represent multiple emergency department providers that bill under a single provider number. The category “high volume providers” probably represents a combination of individual providers and treatment settings where emergency department providers billed under a single provider number.

Outcome Measures for Overall Sample

Descriptive information on the four outcome measures, time loss days, time loss payments and medical costs, is shown in Table 4. Changes from baseline to follow up for the three time loss measures for the COHE group were small and did not achieve statistical significance ($p = .05$). On average, time loss for the COHE group declined by one day from baseline to follow up (14.8 to 13.8 days) and the incidence of time loss declined from 17.1% to 16.1%. There was no change in time loss incidence (20.6% to 21.0%) and days (20.1 to 20.2 days) for the comparison group, and time loss payments increased slightly for that group. Medical costs for the COHE group were somewhat less than medical costs for the comparison group in both time periods

(recall it is not appropriate to compare changes over time in medical costs). The data presented in Table 4 provide evidence of a strong “recruitment effect.” COHE providers had lower rates of time loss (time loss incidence and time loss days) and lower time loss payments even before joining the COHE. The mean days of time loss for COHE providers for the baseline period was 14.8 days as compared with 20.1 days for the comparison group. The differences in time loss incidence, time loss days and time loss payments were maintained during the follow up period. It is unclear why COHE providers had substantially lower time loss rates to begin with. It is possible that providers more knowledgeable about and skilled in delivering workers’ compensation health care may have been more attracted to the COHE intervention and more willing to participate in it.

We repeated the analysis shown in Table 4 but restricted the cases to time loss claims only. Table 5 presents data for both the means and medians (because time loss days and payments are usually highly skewed the median can be a better measure of central tendency). As shown, there was little change in either the mean or median values over time in time loss days or payments (time loss incidence is not shown because all of the data shown in Table 5 represent time loss claims) from baseline to follow up. Medical costs were similar for both groups.

The descriptive data shown in Tables 4 and 5 (and the results of our difference-in-difference statistical analysis not shown) suggest there was little meaningful change over time in the time loss outcome measures associated with the COHE. But as shown in Table 4, injured workers who received treatment from a COHE provider, on average, experienced less disability (fewer time loss days) than injured workers treated by a non-COHE provider. This difference appears to result largely from the recruitment effect described earlier.

Effects of Adoption of Occupational Health Best Practices

As another analysis, we examined the effect of health care provider adoption of occupational health best practices, defined in terms of the following three process measures: (1) submission of the Report of Accident (ROA) within two business days, (2) frequency of use of Activity Prescription Forms (APF), and (3) frequency of provider phone calls related to the claim. We constructed an index representing occupational health best practices based upon these three measures in the same manner as done for previous analyses. That is, we determined the median

percentage value for each of the measures across the COHE health care providers during the follow-up period. We then defined “high adopter” as providers who were above the median value for two of the three measures, and defined “low adopter” as providers who were below the median value on at least two of the three measures.

There were 215 COHE providers who treated 7,596 workers during the follow-up year. Of these 215 providers, 94 (44%) were classified as a “high adopter” and 121 (56%) were classified as a “low adopter.” The high adopter COHE providers treated 3,919 workers (40 workers per provider), whereas the low adopter providers treated 3,677 workers (30 workers per provider). We constructed a linear regression model to assess the relationship between the best practice index and (1) time loss days per claim and (2) time loss costs per claim, controlling for injured worker age and sex, type of injury, the number of injured workers treated by the COHE provider in the follow-up period and baseline provider time loss days.

This analysis found the best practice index to be related to time loss days and time loss costs. Injured workers treated by (COHE) high adopter providers had, on average, 4.0 fewer days of time loss ($p < .01$) and \$169 less ($p < .01$) in time loss costs per claim than injured workers treated by low adopter (COHE) providers. These findings reinforce our earlier findings and underscore the importance of quality improvement efforts aimed at promoting occupational health best practices.

Analysis of Changes in Time Loss Days for Primary Care Providers

The COHE group included providers in different specialties treating a broad array of injuries. As a further analysis, we examined changes in time loss days from baseline to follow up for primary care providers treating back sprains and other sprains. The purpose of this analysis was to determine if among a single group of providers (primary care) treating a relatively homogeneous set of injuries (back sprains and other sprains) there was evidence of a meaningful change in time loss. This analysis was performed on 3,505 claims. While there was no change in time loss days for comparison-group providers (baseline, 27.7 days, follow up, 27.0 days), there was a large and statistically significant decrease in time loss days for COHE providers (baseline, 20.8 days, follow up, 14.1 days). These figures represent unadjusted mean values. We applied the difference-in-difference model to these data (representing back sprain and other sprains treated

by primary care providers) to determine whether statistical analysis would support the observed change in (unadjusted) time loss days. This analysis generated an estimated reduction in time loss of 9 days associated with the COHE ($p = .03$). It appears the COHE was associated with a significant decrease in time loss days for primary care providers treating workers with back sprain or other sprains. We did not observe this same effect when we analyzed the data for all providers and all conditions.

Conclusion

This report has presented findings of the UW's outcome evaluation for the expanded 13-county area served by the Eastern Washington COHE. This largely rural area encompasses a substantial portion of eastern Washington. Overall, the COHE's recruitment of providers in the expansion counties attracted those who already provided care with lower time loss outcomes. However, unlike the previous evaluation in the original 3 Eastern Washington counties, we found little change in outcomes over time for the COHE injured workers relative to the comparison-group injured workers. An important exception to this general finding was the finding of a significant decrease in time loss days associated with the COHE for primary care providers treating injured workers with back sprain or other sprains. For this subgroup of providers treating these conditions, the COHE appeared to have a positive, and statistically significant, effect on time loss. The reasons for these different findings cannot be determined from these data.

One reason an improvement in overall COHE outcomes was not seen during the study period may be related to a lower proportion of COHE claims that received health services coordination (HSC) services. Administrative (billing) data indicate that the HSCs, in general, were involved in considerably fewer claims in the expansion counties than the original three-county target area during their second years of implementation. In the original counties, the HSCs billed for a coordinating activity for 29% of the time loss claims, while they billed for 10% of the time loss claims for the expansion counties. Thus the HSCs became involved in a far smaller proportion of time loss claims in the expansion area.

Our analysis revealed another important finding. As with previous analyses, we found that adoption of occupational health best practices does influence outcomes. Injured workers treated

by COHE providers who adopted best practices more often had significantly fewer time loss days compared to injured workers treated by COHE providers who adopted best practices less often. This finding suggests that COHE best practices are effective in the more geographically dispersed and rural expansion counties. The data reported here also indicate billable, claim-specific health services coordination in the expansion counties occurred for a much lower proportion of claims than it did in the original three counties at the same maturation point (year 2), underscoring the potential importance of this particular COHE best practice.

These findings highlight the importance of (1) ongoing, organized quality improvement activities aimed at facilitating the adoption of occupational health best practices by COHE providers and their practice staff, and (2) assuring sufficient capacity to provide adequate levels of case-specific health services coordination services. Delivering health care services to injured workers in dispersed rural areas of the state yields unique challenges for the COHE model, particularly related to quality improvement efforts in expanding the use of occupational best practices and effective case-specific health services coordination.

Table 1. Number of Claims Analyzed by Year

Study Period	COHE Group	Comparison Group	Total
Baseline Year	6,580	10,500	17,080
Follow-Up Year	7,596	8,643	16,239
Total	14,176	19,143	33,319

Table 2. Distribution of Claims by County (N = 33,319)

County	COHE Group (%)	Comparison Group (%)	Total (%)
Adams	953 (68.3%) ^a	442 (31.7%)	1,395 (4.2%) ^b
Benton	0	5,929 (100%)	5,929 (17.8%)
Chelan	4,265 (77.6%)	1,234 (22.4%)	5,499 (16.5%)
Franklin	0	2,055 (100%)	2,055 (6.2%)
Kittitas	0	1,487 (100%)	1,487 (4.5%)
Okanagan	239 (15.6%)	1,296 (84.4%)	1,535 (4.6%)
Walla Walla	475 (28.5%)	1,191 (71.5%)	1,666 (3.1%)
Whitman	210 (20.1%)	837 (79.9%)	1,047 (3.1%)
Yakima	7,594 (67.2%)	3,702 (32.8%)	11,296 (33.9%)
Other Counties ^c	440 (31.2%)	970 (68.8%)	1,410 (4.2%)
Total	14,176 (43%)	19,143 (57%)	33,319 (100%)

^a % values represent row percent, e.g., the COHE group represents 68.3% of the study population in Adams County; the comparison group accounts for the remaining 31.7% of the study population in Adams County.

^b % values represent column percent, e.g., Adams County represents 4.2% of the total cases.

^c Asotin, Columbia, Douglas, Ferry, Garfield, Lincoln and Pend O'Reille counties.

Table 3. Descriptive Information on Study Groups (N = 33,319)

Characteristic	COHE Group	Comparison Group
Age (mean)	37.0 *	36.6
% Male	70.5 *	71.8
Type of injury		
% Back sprain	13.0 **	11.5
% Carpal tunnel syndrome	0.9 **	1.3
% Fractures	3.5 *	4.6
% Other sprains	24.1 **	18.8
% Other injuries	58.4 **	63.8
Provider type		
% Primary care	45.7 **	33.3
% Surgeon	0.5 **	3.5
% Specialist	0.5 **	2.0
% Emergency room doctor	10.5 **	15.1
% Occupational medicine provider	9.2 **	0.4
% Chiropractor	6.0	5.9
% ARNP	9.4 **	2.9
% Other providers	18.2 **	36.9
Provider volume		
% < 20 claims per year	10.0 **	24.0
% 21 – 80 claims per year	21.1 **	16.2
% 81 – 200 claims per year	14.8 **	11.1
% > 200 claims per year	54.1 **	48.5

Differences are statistically significant: ** $p < .01$; * $p < .05$

Table 4. Descriptive Information (Unadjusted Means) for Outcome Measures (N = 33,319)

Measure	COHE Group (14,176)			Comparison Group (19,143)		
	Baseline	Follow Up	P-Value +	Baseline	Follow Up	P-Value +
Any Time Loss	17.1%	16.1%	.09	20.6%	21.0%	.57
Time Loss Days	14.8	13.8	.14	20.1	20.2	.46
Time Loss Payments	\$625	\$606	.35	\$1,003	\$1,074	.12
Medical Costs	\$2,922	\$2,783	.16	\$3,286	\$3,124	.12

+ P-value indicates statistical significance (one-tailed test) for comparison of change from baseline to follow up within study group in a given measure.

Table 5. Descriptive Information (Unadjusted Means) for Outcome Measures for Time Loss Cases Only (N = 6,325)

Year	<u>COHE Group</u> (N = 2,349)			<u>Comparison Group</u> (N = 3,976)		
	Time Loss Days	Time Loss Payments	Medical Costs	Time Loss Days	Time Loss Payments	Medical Costs
<u>Baseline</u>						
Mean	83.8	\$3,480	\$11,857	91.7	\$4,578	\$11,701
Median	29	\$991	\$4,964	38	\$1,393	\$5,271
<u>Follow Up</u>						
Mean	84.7	\$3,718	\$10,407	93.8	\$4,999	\$10,389
Median	32	\$1,126	\$5,300	39	\$1,679	\$5,321

Appendix

We conducted a number of additional analyses not described in this report to assess the COHE effect. None of these additional analyses found any meaningful difference in the effect on outcomes of the COHE. These additional analyses included:

- Repeated the difference-in-difference analysis but dropped the three counties that contained only non-COHE comparison-group cases
- Repeated the difference-in-difference analysis for Yakima only
- Constructed a data set using providers who had at least 5 claims in both the baseline and follow-up periods (to adjust for provider turnover that may have affected the results)
- Repeated the analysis for a cohort of COHE providers who were recruited later in the implementation period